

REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-70 are pending, of which Claims 1-17, 63, and 67 are active and Claims 18-62, 64-66, and 68-70 are withdrawn. Claims 1, 63 and 67 are amended by the present amendment.

Support for amended Claims 1, 63 and 67 can be found in the disclosure as originally filed. Thus, no new matter has been added.

In the outstanding Office Action, Claims 1-7, 9-13, 63, and 67 were rejected under 35 U.S.C. § 103(a) as unpatentable over Okada et al. (U.S. Pat. No. 6,226,086, herein Okada('086)) in view of Okada et al. (U.S. Pat. No. 5,969,757, herein Okada('757)) and admitted prior art; Claims 8, 14, 16, and 17 were rejected under 35 U.S.C. § 103(a) as unpatentable over Okada('086), Okada('757) and admitted prior art and in further view of Kondo et al. (U.S. Pat. No. 5,731,849, hereafter Kondo); and Claim 15 was rejected under 35 U.S.C. § 103(a) as unpatentable over Okada('086), Okada('757) and admitted prior art in view of Onuki (U.S. Patent Publication No. 2002/0097324).

Before turning to the outstanding prior art rejections, it is believed that a brief review of the present invention would be helpful.

In the past, pixel shift photography has been used to improve solid state image sensing device quality. Pixel shift photography obtains high resolution by combining an image photographed by shifting a subject by half a pixel pitch and an image before such shifting to obtain a single image. Typical examples of image shift mechanisms are shown in Figures 27A-27C of the present specification.

However, using conventional image shift techniques, desired image quality may not be obtained. Namely, due to the movement of a user's hands, movement of the subject, or change in performance of the pixel shift mechanism, image quality may be deteriorated.

When any of these events occurs, the degree of deterioration of the image differs depending on the degree of the shift. In fact, if deterioration of the image crosses a certain threshold, the image becomes inferior as compared to an image obtained using ordinary photography techniques.¹

In light of these difficulties, the Applicants developed the present invention, as recited, for example, in Claim 1. To this end, amended Claim 1 recites, in part,

a judgment unit which judges whether the pixel shift photography on the completed combined image has been performed correctly or not, based on comparing the image data a plurality of images output before the displacement of said image sensing unit with the image data from the plurality of images output after the displacement of said image sensing unit.

Independent Claims 63 and 67 recite analogous features.

Okada('086) describes a moving amount detecting unit 9 uses non-shifted image data "A" stored in image memory 31 and later obtained non-shifted image data "B" stored in image memory 32 to calculate a motion vector.² This motion vector is used estimate movement of the device,³ which is used to calculate the amount of shift needed to correct for the motion.⁴

Okada('757) describes an image inputting apparatus which a first image 21 and a second image 22 are combined into an combined image 23, the combined image is then judged in judgment unit 30 to determine if moiré has been produced based on a measurement of only the combined image 23.⁵

Claim 1 recites "a judgment unit which judges whether the pixel shift photography on the completed combined image has been performed correctly or not, based on comparing the image data a plurality of images output before the displacement of said image sensing unit

¹ Specification, pages 2-3.

² Okada('086), col. 14, lines 51-55.

³ Okada('086), col. 14, lines 55-57.

⁴ Okada('086), col. 16, lines 1-6.

⁵ Okada('757), col. 12, lines 35-38.

with the image data from the plurality of images output after the displacement of said image sensing unit.”

In other words, Claim 1 recites a judgment unit that determines if pixel shift photography has been correctly performed on a combined image comprised of a shifted image and a non-shifted image. The judgment unit makes this determination by comparing the non-shifted image with the shifted image.

In contrast, Okada('086) describes comparing two non-shifted images to determine a motion vector (Fig. 12) which is used to determine a shift amount which is used to create a shifted image. Thus, Okada('086) does not describe comparing a non-shifted and a shifted image to determine if pixel shift photography has been correctly performed.

Further Okada('757) describes testing a combined image to determine if moiré exists on the combined image. Nowhere does Okada('757) describe determining if pixel shift photography has been correctly performed by comparing shifted and non-shifted images as is recited in Claim 1.

In addition, Applicant's admitted prior art does not cure the above noted deficiencies of Okada('086) and Okada('757).

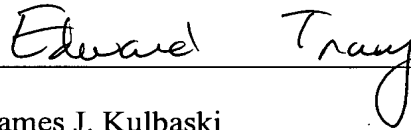
Accordingly, Applicants respectfully submit that Claim 1 and similarly Claims 63 and 67 and claims depending therefrom patentably distinguish over Okada('086), Okada('757) and applicants admitted prior art considered individually or in any proper combination.

Moreover none of the further cited Kondo or Onuki references cure the above noted deficiencies of Okada('086), Okada('757) and applicants admitted prior art with respect to Claims 1, 63 and 67 and claims depending therefrom.

Consequently, in view of the foregoing discussion, it is respectfully submitted that this application is in condition for allowance. Early and favorable action is therefore respectfully requested.

Respectfully submitted,

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A handwritten signature in cursive script, reading "Edward Tracy", is written over a horizontal line.

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